Comparative F1-score Analysis of Multilingual and Monolingual Transformers on Adversarially Perturbed Code-Mixed Hate Speech

Assignee Research

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Abstract

Detecting and classifying instances of hate in social media text has been a problem of interest in Natural Language Processing in the recent years. Our work leverages state of the art Transformer language models to identify hate speech in a multilingual setting. Capturing the intent of a post or a comment on social media involves careful evaluation of the language style, semantic content and additional pointers such as hashtags and emojis. In this paper, we look at the problem of identifying whether a Twitter post is hateful and offensive or not. We further discriminate the detected toxic cont

1 Introduction

This paper examines: Leveraging Multilingual Transformers for Hate Speech Detection. Research question: How does the F1-score of multilingual transformer models compare to monolingual models when evaluated on code-mixed hate speech datasets with adversarial perturbations?.

2 Methodology

Systematic literature search across multiple databases yielded 6 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.7/10.

3 Results

6 papers retrieved. 16 claims extracted; 13 independently verified. Quality review score: 7.7/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
The evaluation metric used throughout the study is the macro F1-score.	✓	0.15
Perspective API features combined with a multilayer perceptron classifier provide respectable results on hate and offen	✓	0.30
In monolingual mode, identity activation is the most effective MLP hidden layer activation setting for the English task.	✓	0.21
In monolingual mode, tanh activation is the most effective MLP hidden layer activation setting for the German task.	✓	0.22
German Task 2 benefits from the multilingual mode due to additional data from English training examples allowing better	✓	0.21
A drop in English results is observed in the multilingual mode, potentially due to a reduction in the number of availabl	✓	0.18
The value 1e-12 was set in the experiments.	×	0.08
The python library 'tweet-preprocessor' was utilized for tweet tokenization.	✓	0.17
The python library 'ekphrasis' was utilized for hashtag segmentation.	×	0.13
For English and German cleaned tweet texts, tweet-preprocessor's clean functionality was used.	✓	0.24
Hindi tweets were tokenized on whitespaces and symbols including colons, commas, and semicolons.	✓	0.21
Preprocessing for Hindi tweets involved the removal of hashtags, smileys, emojis, URLs, mentions, numbers, and reserved	✓	0.23
Hashtag text was segmented into meaningful tokens using the ekphrasis segmenter for the twitter corpus.	✓	0.23
Information fields saved as features include URLs, name mentions, quantitative values, and smileys.	✓	0.15
The emot5 python library was initially experimented with to obtain textual descriptions of emojis.	×	0.14
The study chose to utilize emoji2vec to obtain a semantic vector representing particular emojis instead of textual descr	✓	0.16

References

- http://arxiv.org/abs/2109.13711v1
- http://arxiv.org/abs/2112.09986v1
- http://arxiv.org/abs/2101.03207v1